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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/027,514	12/21/2001	John M. Pigott	SC11926ZC	3716

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MOTOROLA INC
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LAW SECTION
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EXAMINER	
MCCLOUD, RENATA D	
ART UNIT	**PAPER NUMBER**
2837	

DATE MAILED: 03/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/027,514	PIGOTT ET AL	
	Examiner	Art Unit	
	Renata McCloud	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *06/24/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3,9-11,13,18, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Fincher (U.S. 4,851,755).

Claim 1: The apparatus and method for detecting a stall condition of a stepping motor (Fig. 1:10) of the type which includes at least first (Fig. 1:14a) and second coils (Fig. 1:14b) and a rotor (Fig. 1:12) having a plurality of magnetic poles there around (Col. 3:57-60), the apparatus comprising a current generator (Fig. 1:26) for alternately supplying drive currents to said first and second coils causing the rotor to step (Col. 6:9-11), each of said first and second coils generating signals when transitioning from a driven state to a non-driven state, the signals resulting from motion of said rotor (Col. 6:17-24); an integrator having an input coupled to receive signals and for generating an integrated version thereof (Fig. 4E:163); and a comparator coupled to the integrator for comparing the integrated version with a predetermined threshold to detect the stall condition (Fig. 4E: 164).

Claim 2: the signals are of alternating polarity (e.g. Col. 4:66-5:5).

Claim 3: means connected to the integrator for correcting the polarity of the signals (e.g. Col. 4: 30-35).

Claims 9 and 18: An apparatus and method for detecting a stall condition of a stepping motor (Fig. 1:10) of the type which includes at least first (Fig. 1:14a) and second coils (Fig. 1:14b) and a rotor (Fig. 1:12) having a plurality of magnetic poles there around (Col. 3:57-60), the apparatus comprising a current generator (Fig. 1:26) for alternately supplying drive currents to said first and second coils causing the rotor to step (Col. 6:9-11), each of said first and second coils generating back emf voltage signals when transitioning from a driven state to a non-driven state, the signals resulting from motion of said rotor (Col. 5:21-22; 6:17-24); an integrator having an input coupled to receive signals and for generating an integrated version thereof (Fig. 4E:163); and a comparator coupled to the integrator for comparing the integrated version with a predetermined threshold to detect the stall condition (Fig. 4E: 164).

Claim 10: the bemf signals are of alternating polarity (e.g. Col. 4:66-5:5).

Claims 11 and 19: means connected to the integrator for correcting the polarity of the bemf signals (e.g. Col. 4: 30-35).

Claim 13: a comparator coupled to the integrator for comparing the integrated version with a predetermined threshold to detect the stall condition (Fig. 4E: 164).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 14, 15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fincher (U.S. 4,851,755) in view of Gutierrez (U.S. 6,014,000).

Claim 14: Fincher teaches an apparatus for detecting a stall condition of a stepping motor (Fig. 1:10) of the type which includes at least first (Fig. 1:14a) and second coils (Fig. 1:14b) and a rotor (Fig. 1:12) having a plurality of magnetic poles there around (Col. 3:57-60), the apparatus comprising a current generator (Fig. 1:26) for alternately supplying drive currents to said first and second coils causing the rotor to step (Col. 6:9-11), each of said first and second coils generating signals when transitioning from a driven state to a non-driven state, the signals resulting from motion of said rotor (Col. 6:17-24); an integrator having an input coupled to receive signals and for generating an integrated version thereof (Fig. 4E:163); and a comparator coupled to the integrator for comparing the integrated version with a predetermined threshold to detect the stall condition (Fig. 4E: 164). Fincher does not teach a display actuator coupled to the rotor for movement by the rotor to reflect a measure of a variable.

Gutierrez teaches a display actuator coupled to the rotor for movement by the rotor to reflect a measure of a variable (e.g. Fig. 1: 116). It would have been obvious to one having ordinary skill in the art at the time that the invention was made to modify the apparatus taught by Fincher to include a display as taught by Gutierrez. The advantage of this would be the ability to alert a user of the apparatus that a stall condition has occurred.

Claim 15: Fincher and Gutierrez teach the limitations of claim 14. Referring to claim 15, Fincher teaches the signals are of alternating polarity (e.g. Col. 4:66-5:5), and means coupled to the integrator for correcting the polarity (e.g. Col. 4: 30-35).

Claim 17: Fincher and Gutierrez teach the limitations of claim 14. Referring to claim 17, Fincher teaches a comparator coupled to the integrator for comparing the integrated version with a predetermined threshold to detect the stall condition (Fig. 4E: 164).

5. Claims 4-8,12,16, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fincher et al as applied to claims 3,10, 15, and 19 above, in view of Ito et al (U.S. Patent 4,491,424).

Claims 4, 12, 16, and 20: Fincher teaches the limitations of claim 3, 10, 15, and 19. Referring to claims 4, 12, 16, and 20, Fincher does not teach a blanking circuit. Ito et al teach a blanking circuit for masking an initial portion of each signal (Fig. 22), the initial portion corresponding to the time it takes for the drive current in each of said first and second coils to substantially decay (Fig. 26). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the electronic apparatus taught by Fincher to include the teachings of Ito et al. The advantage of this would be an electronic apparatus with pulse width optimization for driving a motor, which does not require an externally connected precision resistance.

Claim 5: Fincher and Ito et al teach the limitations of claim 4. Referring to claim 5, Fincher teaches a control circuit coupled to the current generator and correcting means (e.g. Fig. 1:19).

Claim 6: Fincher and Ito et al teach the limitations of claim 5. Referring to claim 6, Fincher teaches the current generator comprises a first switching circuit coupled to the control circuit and controlled thereby (e.g. Fig. 4D: 26a).

Claim 7: Fincher and Ito et al teach the limitations of claim 6. Referring to claim 7, Fincher teaches the polarity correction means comprises a second switching circuit coupled to the control circuit and controlled thereby (e.g. Fig. 4D: 26b).

Claim 8: Fincher and Ito et al teach the limitations of claim 7. Referring to claim 8, Ito et al teach the blanking circuit comprises a switching circuit coupled to the control circuit and controlled thereby (e.g. Fig. 22).

Response to Arguments

6. Applicant's arguments filed 15 December 2003 have been fully considered but they are not persuasive. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., an integrator that receives signals from a current generator used to provide drive current to first and second coils) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Claim 1 recites "each of said coils generating signals

when transitioning from a driven state to a non-driven state, said signals resulting from motion of said motor; an integrator having an input coupled to receive said signals". According to the claim language, the signals are from the coils, and not the current generator. Therefore, Fincher teaches, referring to Fig. 2, an MDA (26) that sends current to the coils (14a-d). The coils produce a signal that is output through a signal line (31). The signal is further output as a power command signal via signal line (44) to a PWM module (30). The PWM module comprises an integrator (163) that integrates the signal (see Col. 3: 57-4: 35, Col. 11: 4-21).

In response to applicant's argument that Fincher does not teach a comparator coupled to the integrator for comparing an integrated version with a predetermined threshold, Fincher teaches, referring to Fig. 4E, a comparator (164) which is coupled to the integrator (163), the comparator comparing the integrated signal from the integrator (163) and comparing it to a threshold (Col. 11:4-21).

There is nothing in applicant's claim language that precludes the examiner from reading Fincher as meeting the claimed limitation.

Conclusion

7. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Renata McCloud whose telephone number is (571) 272-2069. The examiner can normally be reached on Mon.- Fri. from 8 am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Nappi can be reached on (571) 272-2800 ext. 37. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Renata McCloud
Examiner
Art Unit 2837

RDM

ROBERT NAPPI
SUPERVISORY PATENT EXAMINER